CoRIS Metadata Standards and Guidelines

Version 1.1

NOAA Coral Reef Information System - CoRIS

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1 CoRIS

NOAA's Coral Reef Information System (CoRIS) is the official NOAA system for managing access to its coral reef data and information. CoRIS is a web-enabled, GIS-enhanced, state-of-the-art information system utilizing a single web portal to gain access to NOAA's coral reef data and information holdings, activities, and library services. CoRIS supports NOAA's contribution to the U.S. Coral Reef Task Force National Action Plan and provides a rich offering of search tools to aid in the discovery and interpretation of NOAA data and information on coral reef ecosystems and adjacent interrelated habitats and communities.

The route to locate the broad array of diverse coral reef data and information is through metadata, which are critical for the CoRIS sophisticated data search and discovery mechanism. The efficiency and profitability of the search strategy is only as good as the completeness and correctness of the metadata.

In order to ensure uniformity in metadata creation, and to ensure legal and policy requirements, CoRIS metadata will adhere to the Federal Geographic Data Committee (FGDC) Standard. CoRIS scientific and IT developers identified complex and diverse metadata creation issues unique to coral reef data and information. As a result, CoRIS coral reef metadata guidelines and standards and instructions were compiled to guide the metadata preparers in the coral reef community. While specific to coral reef data, these standards and guidelines are relevant and useful to all NOAA data disciplines.

In order to facilitate the data and information discovery process, CoRIS science experts developed hierarchically arranged suites of standardized keywords, selections of which will be within the content of each metadata record. The keywords designate the search criteria for geography, time, data products, data themes, parameters, methods and protocols.

A protocol for CoRIS metadata management was developed, which includes metadata submission, QC validation, processing flow, and database storage and maintenance.

1.1 Audience

This document is intended for a principal investigator or a metadata creator working for a principal investigator. It is assumed that the reader of this document already has knowledge of data capture and data categorization. This document is focused on helping that individual with requirements for metadata that is to be submitted for inclusion in CoRIS.

1.2 Data Restrictions

In general, CoRIS data are available to everyone. There should be no access constraints for CoRIS data or metadata. There should be no use constraints other than requiring citation of contributors when the data are used.

2 CoRIS Metadata

Just as the library card catalog is the way to find books and journals, the route to NOAA coral reef data and information is through metadata. For the person searching for coral reef data, concise, complete and accurate descriptions of data are essential to (1) finding, and (2) understanding the data.

Metadata are important for the CoRIS data search and discovery mechanism. They support the effective, long-term use of the data being served. To ensure uniformity in metadata, and to meet legal requirements, CoRIS metadata will adhere to the Federal Geographic Data Committee (FGDC) standard. This document outlines standards and guidelines for creating metadata for CoRIS.

3 What are Metadata?

Metadata consist of information that characterizes data. Metadata are used to provide documentation for data products. In essence, metadata answer who, what, when, where, why, and how about every facet of the data that are being documented.

Sample metadata records are provided in Appendix A.

4 Metadata Principles

Development and management of CoRIS metadata are based on the following principles.

1. Metadata are central to CoRIS data and information search and discovery.
2. CoRIS metadata structure is based on existing standards – MARC, FGDC, and FGDC extentions, including NOAA, Biological and Shoreline.
3. Metadata are reviewed for completeness and compliance with CoRIS standards to ensure proper functioning of CoRIS data discovery operations.
4. Data linkages from metadata do not lead users to web sites that must be searched yet again.
5. Metadata are preserved in a secure environment to guard against loss and ensure continuing availability.
6. Metadata are periodically updated to reflect changes in the data set(s), data access and/or other information contained in metadata files.

5 Metadata Standards

CoRIS metadata standards begin with the content standard defined by the Federal Geographic Data Committee. If your data include biological taxonomy, the National Biological Information Infrastructure (NBII) extensions to the FGDC content standard should be used. A proposed extension to FGDC for shoreline data, can be used to document the critical processes and conditions that revolve around creating and collecting shoreline data.

Full documentation is available for the three content standards:

FGDC - http://www.fgdc.gov/metadata/contstan.html
NBII - http://www.fgdc.gov/standards/status/sub5_2.html
Shoreline - http://www.fgdc.gov/standards/status/sub5_6.html

The elements identified below are required for the CoRIS search and discovery mechanisms:

Section 1: Identification
- Element 1.1 Citation - Use of Online Linkage (section 8.10) information is mandatory if the originator of the data maintains the data at an online location. (See FAQ “What is the difference between the Online Linkage and the Network Resource Name tag?”)
- Element 1.2 Description
- Element 1.3 Time Period of Content
- Element 1.4 Status
- Element 1.5 Spatial Domain
- Element 1.6 Keywords
- Element 1.6 1/2 (Taxonomy) - Mandatory for biological data

Section 6: Distribution
- Element 6.1 Distributor
- Element 6.4 Standard Order Process - Use of Network Resource Name (6.4.2.2.1.1.1.1) is required for data served by a distribution center, such as an archive or data center.
- Other Portions of Section 6 are mandatory if they are applicable.

Other sections are mandatory if applicable. In particular, Section 2 Data Quality, and Section 4 Spatial Reference, if applicable, should be included for quantitative data (e.g. numeric data files,

video transects, etc.). Section 3 Spatial Data Organization, Section 5 Entity and Attribute, if applicable, should be used for spatial data (e.g. maps, georeferenced images, GIS files). When at all possible, fill in as many sections as you can. The more complete a metadata record, the greater its value.

6 Metadata Guidelines

The following sections provide information to assist in creating and submitting metadata to CoRIS.

6.1 Creating Metadata

Metadata can be created through use of software designed for that purpose, or by using a text editor. The text editor or word processor option is used to edit a template document that contains all or most of the possible metadata elements, and to add text to those elements that are appropriate. Unneeded or empty elements are deleted, repeating elements must be copied and pasted repeatedly. ASCII templates are simple to use, require no Geographic Information System (GIS) software or other specialized software, and may be cloned for parts of the metadata that are common to several data sets. A major drawback for templates is that there is no built in control of the structure. In the process of cutting and pasting it is easy to damage the structure of the template so it is no longer FGDC compliant.

For CoRIS metadata preparers, an ASCII template of required and mandatory-if-applicable fields for CoRIS is available in Appendix B. Use this template if it is ppropriate for describing your data. If not, an ASCII template of the full FGDC metadata is available from Appendix C and also in http://badger.state.wi.us/agencies/wlib/sco/metatool/template.htm.

Metadata authoring software tools of various capabilities are available. Appendix D contains a (non-exclusive) list of some software.

Whichever method is used to create metadata, the final product is to be provided to CoRIS in ASCII text format. Authors are encouraged to use the CNS (Chew aNd Spit) and MP (Metadata Parser) tools (see figure 1) for error checking. The MP tool checks for consistency with the FGDC standards and provides for export of metadata in XML (eXtensible Markup Language), SGML (Standard Generalized Markup Language), and HTML (HyperText Markup Language), if desired. For additional information, see: http://www.fgdc.gov/metadata/toollist/metatool.html , and http://www.geology.usgs.gov/tools/metadata .

6.2 A Note about Keywords

Keywords are very important in making it possible for someone searching for data to find those data sets that meet their search criteria. Metadata should include keywords from the CoRIS Thesaurus, which includes ‘Theme’ keywords, ‘Place’ keywords, a set of discovery keywords that identify data according to type. Most datasets will have at least one place and one discovery keyword, in addition to one or more theme keywords. The CoRIS Thesaurus is available at http://www.ngdc.noaa.gov/paleo/coris/coris.html.

6.3 Specifying Dates

Most data sets will have starting and ending dates that precede the present date. However, some data sets and/or products are available in near real-time. For example, several real-time products that relate to coral reef bleaching are available through CoRIS. The products are produced periodically (e.g. twice weekly) from up-to-date AVHRR data.

Element 1.3, Time Period of Content, includes Beginning_Date and Ending_Date fields, under Range_of_Dates/Times. For historical data sets (i.e. earlier than today), the dates on which data collection began and ended should be included in those fields. For real-time data, enter the earliers date of the data set or product in Beginning_Date. Enter the word "Present" in the field Ending_Date.

6.4 Parent/Child Metadata

Some data sets are best described by one parent metadata file and numerous child or children metadata files. The parent file describes most data set characteristics, such as data source, methodology, contacts and so on that are shared by all child metadata files. Each metadata child contains specific information for a searchable file that varies from the parent in only a few specific fields. The parent metadata file contains information that is common to all children. An example is a library of aerial photographs that were collected with one methodology but vary in the geographic coordinates of each photo. Each metadata child contains information that is specific to one photo or group of photos. In this way, the person who searches for data in a specific region is best served by being able to find the photos (described in child metadata) that fit her narrow search region, rather than finding reference to a data set that contains thousands of photos in a broad geographic region.

Submission of parent/child metadata follows a process similar to the one described above. However, two files will need to be submitted, the first an FGDC compliant metadata record for the parent and the second a table containing the data for the individual children. See the FAQ for more information about parent/child metadata.

6.5 Metadata Flow and Submitting Metadata

As shown in figure 1, the creator of the metadata, who may be the principal investigator or another individual, uses their knowledge of the data to create metadata. The metadata creator will include CoRIS keywords as described elsewhere in this document. The metadata creator can use any tool of their choosing to create metadata as long as the tool can produce metadata records in ASCII text format. (Tools for metadata creation are described in Appendix D of this document.)

Once the metadata record has been created the responsible principal investigator, assuming they are not the metadata creator, reviews the record. The purpose of this review is to ensure that the scientific content, such as the data set description, methodology, etc., is correct. Programs CNS and MP, available at http://geology.usgs.gov/tools/metadata, assist in checking the format and completeness of metadata.

When the principal investigator is satisfied with the metadata, a final ASCII text version of the metadata record is created for shipment to CoRIS. Using ftp, the completed metadata records are transmitted to the CoRIS "drop box" which can be found at ftp://ftp.nodc.noaa.gov/pub/incoming/CoRIS.

The CoRIS metadata coordinator works with principal investigators or their metadata contacts to assist and answer questions about format, content, or how to transfer files. Once metadata files are received, the facilities and personnel of CoRIS and NOAA Server will be used to review metadata files and work with contributors to develop good data set descriptions. The steps that are used in metadata review are outlined in the next section.

Contact the CoRIS metadata coordinator if you have questions about creating or contributing metadata. At this time the contact Doug Hamilton can be reached at 301-713-3267 x162 (Doug Hamilton) or by email to Coris@noaa.gov .

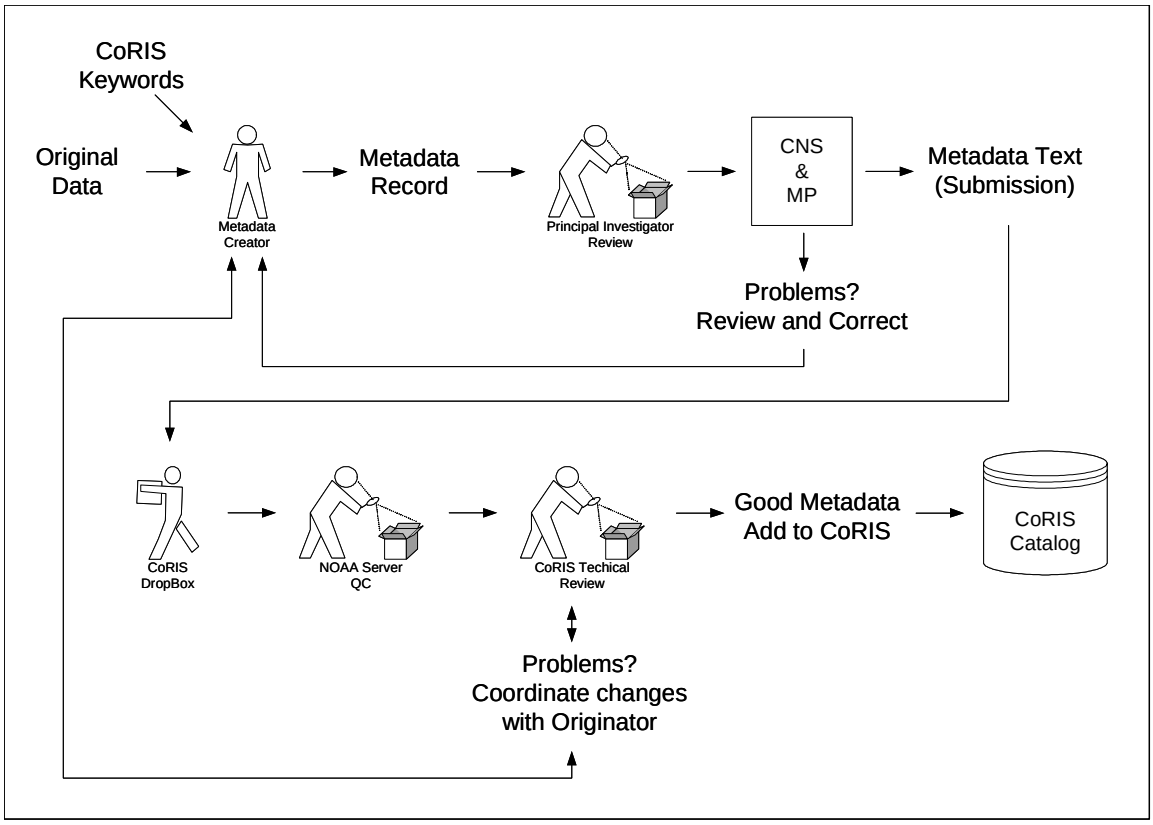

Figure 1 - Process for creating and checking CoRIS metadata.

7 Metadata Quality Control

Metadata files are the path through which many coral reef data sets can be discovered in the CoRIS web site. They hold the information a user will review to decide whether or not the described data set is of interest. CoRIS recognizes that those who collect and understand the data are in the best position to provide clear descriptions of the data in metadata files.

The following tests are used to find items in metadata files that might need attention. During the review process, CoRIS works with metadata providers to produce good metadata.

1. Are all required field names present, including place-holding names? The set of required fields for CoRIS are listed in the template (Appendix B).
    a. If required fields are missing, CoRIS will work with the metadata originator to update the metadata file in question.

2. Does the title describe the data adequately; usually the title should answer the 'what', 'where' and possibly 'when' of the data.

3. Is the abstract a good summary description?

4. Are CoRIS keywords included?

5. Are the structure and content of metadata fields valid? The software MP (Metadata Parser) is used for these tests.

a. CoRIS will work with the metadata contributor to improve the metadata file, if needed.

6. Are data made available online or, if not, are instructions provided for offline access?
   a. If data are served from the data originator's site, the URL that leads to data would be included in Online_Linkage.
   b. If data are being made available online from a distribution center, the URL that leads to data would be in Network_Resource_Name.
   c. If a preview or browse graphic is available, the URL that leads to it would be included in Browse_Graphic.
   d. If data are being made available offline, instructions for data access would be found in Ordering_Instructions.

7. Do URL links lead to browse graphics and/or data sets?

8. After new metadata files are added to CoRIS, the system will be tested to make sure that CoRIS returns the same information that was provided by the contributor.

9. If child metadata are included, fields in child records will be reviewed as they would be in a parent record.

The target design for the flow of metadata into CoRIS, its quality control and utilization by two search engines (spatial and keyword) is diagrammed in Appendix F. Early versions of CoRIS will treat metadata that contain hundreds or thousands of searchable data products (e.g. aerial photos) differently than other metadata.

8 Instructions for completing metadata fields

The following contains instructions for a metadata record following the FGDC format. For further information, please see http://geology.usgs.gov/tools/metadata/tools/doc/ctc/ .

Instructions: Capitalized words are instructions, or provide an example or suggested value. Some fields or groups can be repeated. For example, Originator can be repeated to name more than one person.
NOTE: Underlined field names must be included, or are to be included if applicable.

Metadata:
  Identification_Information:
    Citation:
      Citation_Information:
        Originator:
          ENTER THE NAME OF THE DATA ORIGINATOR HERE; may be repeated
        Publication_Date:
          ENTER DATE IN THE FORM YYYYMMDD or YYYYMM.
        Title:
          CREATE A MEANINGFUL TITLE FOR THESE DATA IF ONE DOES NOT ALREADY EXIST
          Guidelines for creating a title: Where/What/When/How
        Online_Linkage:
          Mandatory if applicable.
          ENTER THE ONLINE LOCATION of the data as maintained by the originator of the data. Do not include this field if the originator does not maintain the data online. If possible the location should be expressed as a URL. See FAQ "What is the difference between the Online Linkage and the Network Resource Name tag?" for additional information.
    Description:
      Abstract:

COPY AN EXISTING ABSTRACT OR CREATE A BRIEF (MAXIMUM THREE PARAGRAPHS) ABSTRACT THAT DESCRIBES THE CONTENTS OF THESE DATA Guidelines for creating an abstract: put your initials (e.g., DWC) at the end of the text if you made up a new abstract; put "originator" at the end of the text if you copied an existing abstract.

Purpose:

STATE THE PURPOSE FOR WHICH THESE DATA WERE COLLECTED.

Time_Period_of_Content:

Time_Period_Information:

USE ONE OF THREE OPTIONS – SINGLE DATE, MULTIPLE DATES OR RANGE OF DATES.

Single_Date/Time:

Calendar_Date:

ENTER SINGLE DATE, IF DATA WERE COLLECTED DURING ONE DAY, ONE MONTH OR ONE YEAR. FORMAT IS YYYYMMDD, YYYYMM, *OR YYYY*.

Multiple_Dates/Times:

REPEAT THIS ENTIRE GROUP FOR MULTIPLE DATES.

Single_Date/Time:

Calendar_Date:

ENTER CALENDAR DATE ON WHICH DATA WERE COLLECTED.

Range_of_Dates/Times:

Beginning_Date:

EARLIEST DATE OF OBSERVATION IN THESE DATA Use the format YYYY, YYYYMM, or YYYYMMDD, depending on how much you know about these data. For real-time data sets, enter the beginning date of the series of real-time data or products.

Ending_Date:

LATEST DATE OF OBSERVATION IN THESE DATA Use the format YYYY, YYYYMM, or YYYYMMDD, depending on how much you know about these data. For real-time data sets, enter the word "Present".

Currentness_Reference:

CHOOSE FROM "Ground condition", meaning data represent conditions on or during the dates specified, or "Publication date", meaning date on which data were published.

Status:

Progress:

CHOOSE FROM "In work", "Complete"

Maintenance_and_Update_Frequency:

CHOOSE FROM "As needed", "None", OR SOME OTHER TIME PERIOD ("Weekly", "Yearly", etc.) THAT APPLIES TO THESE DATA

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate:

WESTERNMOST LONGITUDE OF DATA EXTENT IN DECIMAL DEGREES, WEST IS NEGATIVE, EAST IS POSITIVE

East_Bounding_Coordinate:

EASTERNMOST LONGITUDE OF DATA EXTENT IN DECIMAL DEGREES, WEST IS NEGATIVE, EAST IS POSITIVE

North_Bounding_Coordinate:

NORTHERNMOST LATITUDE OF DATA EXTENT IN DECIMAL DEGREES, SOUTH IS NEGATIVE, NORTH IS POSITIVE

South_Bounding_Coordinate:

SOUTHERNMOST LATITUDE OF DATA EXTENT IN DECIMAL DEGREES, SOUTH IS NEGATIVE, NORTH IS POSITIVE

Keywords:

Theme:

THEME KEYWORDS ARE MANDATORY.

Theme_Keyword_Thesaurus:

ENTER "CoRIS Theme Keyword Thesaurus 1.0". You may repeat this element with other thesauri, if necessary for your data. To do that, repeat the "Theme_Keyword_Thesaurus:" element and then list the keywords from that thesaurus.

Theme_Keyword:

KEYWORD FROM THE THESAURUS NAMED ABOVE May be repeated unlimited number of times. All keywords must be preceded by "Theme_Keyword.". Include one and only one keyword from the Discovery Thesaurus.

Place:

PLACE KEYWORDS ARE OPTIONAL; may be repeated.

Place_Keyword_Thesaurus:

PICK ONE (OR MORE) OF THE AVAILABLE PLACE THESAURI IN APPENDIX E TO CHARACTERIZE THESE DATA You can use more than one of these choices in one record, just repeat the "Place_Keyword_Thesaurus:" element and then list the keywords from that thesaurus.

Place_Keyword:

KEYWORD FROM THE PLACE THESAURUS NAMED ABOVE May be repeated unlimited number of times. All keywords must be preceded by " Place_Keyword:"

Stratum:

STRATUM KEYWORDS ARE OPTIONAL; may be repeated.

Stratum_Keyword_Thesaurus:

PICK ONE (OR MORE) OF THE AVAILABLE STRATUM THESAURI TO CHARACTERIZE THESE DATA Primary choices are "CoRIS Keyword Thesaurus". You can use more than one of these choices in one record, just repeat the "Stratum_Keyword_Thesaurus:" element and then list the keywords from that thesaurus.

Stratum_Keyword:

KEYWORD FROM THE STRATUM THESAURUS NAMED ABOVE May be repeated unlimited number of times. All keywords must be preceded by " Stratum_Keyword:"

Taxonomy:

TAXONOMY KEYWORDS ARE MANDATORY IF DATA INCLUDE TAXON IDENTITY.

Keywords/Taxon:

Taxonomic_Keyword_Thesaurus:

PICK ONE (OR MORE) OF THE AVAILABLE TAXONOMIC THESAURI TO CHARACTERIZE THESE DATA. You can use more than one of these choices in one record, just repeat the "Keywords/Taxon:" element and then list the thesaurus and the keywords from that thesaurus.

Taxonomic_Keywords:

ENTER ONE OR MORE TAXONOMIC KEYWORDS, EACH ONE PRECEDED BY "Taxonomic_Keywords:".

Taxonomic_Classification:

Taxon_Rank_Name:

ENTER THE RANK OR LEVEL in the taxonomy. Examples are "Kingdom", "Genus", etc.

Taxon_Rank_Value:

ENTER THE NAME REPRESENTING THE TAXONOMIC RANK.

Applicable_Common_Name:

ENTER ANY APPLICABLE COMMON NAMES for the given taxonomic rank and value. This element can be repeated for multiple common names.

Taxonomic_Classification:

REPEAT THE PREVIOUS STRUCTURE for as mane ranks as are described.

EXAMPLE OF TAXONOMIC CLASSIFICATION:

Taxonomic_Classification:
Taxon_Rank_Name: Kingdom
Taxon_Rank_Value: Plantae
Applicable_Common_Name: plants
Taxonomic_Classification:
Taxon_Rank_Name: Division

Taxon_Rank_Value: Magnoliaphyta
Taxonomic_Classification:
Taxon_Rank_Name: Class
Taxon_Rank_Value: Magnoliopsida
Taxonomic_Classification:
Taxon_Rank_Name: Subclass
Taxon_Rank_Value: Rosidae
Taxonomic_Classification:
Taxon_Rank_Name: Order
Taxon_Rank_Value: Sapindales
Taxonomic_Classification:
Taxon_Rank_Name: Family
Taxon_Rank_Value: Aceraceae
Applicable_Common_Name: maples
Taxonomic_Classification:
Taxon_Rank_Name: Genus
Taxon_Rank_Value: Acer
Applicable_Common_Name: maples
Taxonomic_Classification:
Taxon_Rank_Name: Species
Taxon_Rank_Value: Acer rubrum var. rubrum
Applicable_Common_Name: red maple

Access_Constraints:
SHOULD BE "None" BECAUSE CoRIS DATA ARE ACCESSIBLE BY ALL.
Use_Constraints:
ENTER "None" BECAUSE CoRIS DATA ARE USEABLE BY ALL. The NOAA Paleoclimatology Program specifies "Cite contributors when using this data".
Browse_Graphic:
This group is to be used to identify the URL of a preview of browse graphic file. It is optional and repeatable.
Browse_Graphic_File_Name:
MANDATORY FOR BROWSE_GRAPHIC. Enter the name of a related graphic file that provides an illustration of the data set.
Browse_Graphic_File_Description:
MANDATORY FOR BROWSE_GRAPHIC. Enter a text description of the illustration.
Browse_Graphic_File_Type:
MANDATORY FOR BROWSE_GRAPHIC. Enter the graphic file type of a related graphic file, from the following list.
"CGM".....Computer Graphics Metafile
"EPS".....Encapsulated Postscript format
"EMF".....Enhanced Metafile
"GIF".....Graphic Interchange Format
"JPEG".....Joint Photographic Experts Group format
"PBM".....Portable Bit Map format
"PS".....Postscript format
"TIFF".....Tagged Image File Format
"WMF".....Windows metafile
"XWD".....X-Windows Dump
Distribution_Information:
THIS ENTIRE GROUP CAN BE REPEATED
Distributor:
Contact_Information:
NOTE: INCLUDE EITHER CONTACT PERSON PRIMARY OR CONTACT ORGANIZATION PRIMARY.
Contact_Person_Primary:

Contact_Person:
Enter the name of the contact person.
Contact_Organization_Primary:
Contact_Organization:
NAME OF THE ORGANIZATION FROM WHOM THE DATA MAY BE OBTAINED
Contact_Address:
THIS ENTIRE GROUP CAN BE REPEATED
Address_Type:
"MAILING', OR "PHYSICAL", OR BOTH
Address:
STREET OR MAILING ADDRESS
City:
CITY NAME
State_or_Province:
STATE OR PROVINCE NAME
Postal_Code:
POSTAL CODE
Country:
COUNTRY
Contact_Voice_Telephone:
THE TELEPHONE NUMBER BY WHICH INDIVIDUALS CAN SPEAK TO THE ORGANIZATION OR INDIVIDUAL; can be repeated.
Distribution_Liability:
STATEMENT OF LIABILITY, IF ANY, ASSUMED BY THE DISTRIBUTOR
FOR EXAMPLE: NOAA makes no warranty regarding these data, expressed or implied, nor does the fact of distribution constitute such a warranty. NOAA and NODC cannot assume liability for any damages caused by any errors or omissions in these data, nor as a result of the failure of these data to function on a particular system.
Standard_Order_Process:
USE NON-DIGITAL FORM FOR DATA AVAILABLE IN NON-DIGITAL FORM; USE DIGITAL FORM FOR DATA AVAILABLE IN DIGITAL FORM; can be repeated.
Non_Digital_Form:
DESCRIBE HOW TO OBTAIN DATA IN NON-DIGITAL FORM.
Digital_Form:
THIS ENTIRE GROUP CAN BE REPEATED
Digital_Transfer_Information:
Format_Name:
THE NAME OF THE DATA TRANSFER FORMAT, USING ONE OF THE FOLLOWING:
"ARCE" . . . . . ARC/INFO Export format
"ARCG" . . . . . ARC/INFO Generate format
"ASCII". . . . . ASCII file, formatted for text attributes, declared format
"BIL". . . . . Imagery, band interleaved by line
"BIP". . . . . Imagery, band interleaved by pixel
"BSQ". . . . . Imagery, band interleaved sequential
"CDF". . . . . Common Data Format
"CFF". . . . . Cartographic Feature File (U.S. Forest Service)
"COORD". . . . . User-created coordinate file, declared format
"DEM". . . . . Digital Elevation Model format (U.S. Geological Survey)
"DFAD" . . . . . Digital Feature Analysis Data (National Imagery and Mapping Agency)
"DGN". . . . . Microstation format (Intergraph Corporation)
"DIGEST" . . . . Digital Geographic Information Exchange Standard
"DLG". . . . . Digital Line Graph (U.S. Geological Survey)
"DTED" . . . . . Digital Terrain Elevation Data (MIL-D-89020)
"DWG". . . . . AutoCAD Drawing format
"DX90" . . . . . Data Exchange '90
"DXF". . . . . AutoCAD Drawing Exchange Format

"ERDAS". . . . . ERDAS image files (ERDAS Corporation)
"GRASS". . . . . Geographic Resources Analysis Support System
"HDF". . . . . Hierarchical Data Format
"IGDS" . . . . . Interactive Graphic Design System format (Intergraph Corporation)
"IGES" . . . . . Initial Graphics Exchange Standard
"MOSS" . . . . . Multiple Overlay Statistical System export file
"netCDF" . . . . network Common Data Format
"NITF" . . . . . National Imagery Transfer Format
"RPF". . . . . Raster Product Format (National Imagery and Mapping Agency)
"RVC". . . . . Raster Vector Converted format (MicroImages)
"RVF". . . . . Raster Vector Format (MicroImages)
"SDTS" . . . . . Spatial Data Transfer Standard (Federal Information Processing Standard *173)*
"SIF". . . . . Standard Interchange Format (DOD Project 2851)
"SLF". . . . . Standard Linear Format (National Imagery and Mapping Agency)
"TIFF" . . . . . Tagged Image File Format
"TGRLN". . . . . Topologically Integrated Geographic Encoding and Referencing (TIGER) Line format (Bureau of the Census)
"VPF". . . . . Vector Product Format (National Imagery and Mapping Agency)
"free text". . . . Name of local or other format.

Digital_Transfer_Option:
USE ONLINE OPTION IF DATA ARE AVAILABLE ONLINE, OR OFFLINE OPTION IF DATA ARE NOT AVAILABLE ONLINE; can be repeated.

Online_Option:
Computer_Contact_Information:
Can be repeated.
Network_Address:
Network_Resource_Name:
THE ELECTRONIC ADDRESS AND NAME OF THE FILE OR SERVICE FROM WHICH THE DATA SET CAN BE OBTAINED. This element may be repeated.

Offline_Option:
Offline_Media:
ENTER ONE OF THE FOLLOWING:
"CD-ROM"
"3-1/2 inch floppy disk"
"5-1/4 inch floppy disk"
"9-track tape"
"4 mm cartridge tape"
"8 mm cartridge tape"
"1/4-inch cartridge tape"
Free text description of media.

Recording_Format:
DESCRIBE THE RECORDING FORMAT WITH FREE TEXT OR:
"cpio"
"tar"
"High Sierra"
"ISO 9660"
"ISO 9660 with Rock Ridge extensions"
"ISO 9660 with Apple HFS extensions"

Fees:
DESCRIBE THE FEES AND TERMS, IF ANY, FOR RETRIEVING THE DATA SET.

Ordering_Instructions:
IF YOU (THE DATA ORIGINATOR) PLAN TO DISTRIBUTE THE DATA OFFLINE, PLEASE INCLUDE INSTRUCTIONS FOR ORDERING DATASET COPIES.

Metadata_Reference_Information:

Metadata_Date:
DATE METADATA DESCRIPTION WAS CREATED Use the YYYYMMDD format.
Metadata_Contact:
Contact_Information:
USE EITHER CONTACT PERSON PRIMARY OR CONTACT ORGANIZATION PRIMARY
Contact_Person_Primary:
Contact_Person:
NAME OF PERSON CREATING THE METADATA FOR THESE DATA
Contact_Organization_Primary:
Contact_Organization:
ENTER THE NAME OF THE ORGANIZATION
Contact_Address:
THIS ENTIRE GROUP CAN BE REPEATED.
Address_Type:
ENTER "Mailing" OR "Physical".
Address:
MAILING AND/OR PHYSICAL ADDRESS OF THE PERSON NAMED ABOVE. This element may be a single line or multiple lines. City, State, Zip/postal code, country, telephone, fax, and email address go in the specific, self-explanatory elements that follow.
City:
CITY IN ADDRESS
State_or_Province:
STATE IN ADDRESS
Postal_Code:
5 OR 9 DIGIT US ZIP CODE OR INTERNATIONAL POSTAL CODE
Country:
COUNTRY NAME It is not necessary to use US, USA, or America. Use for non-US addresses.
Contact_Voice_Telephone:
PHONE NUMBER; can be repeated.
Metadata_Standard_Name:
PICK ONE OF:
"FGDC Content Standard for Digital Geospatial Metadata with NOAA Extensions"
"NBII Content Standard for National Biological Information Infrastructure Metadata"
Metadata_Standard_Version:
FGDC-STD-001-1998

9 Frequently Asked Questions

This section provides answers to questions that have arisen as part of development of metadata for CoRIS. Many questions regarding metadata issues can be found in the FAQs that are part of the FGDC standard (see reference above).

1. Where can I find more information about how to produce metadata?

The FGDC standard contains a lot of explanatory text and FAQs. In addition, the following three web sites contain useful additional material:

1. Coastal Metadata with Metadata Bob, found at http://www.csc.noaa.gov/metadata/text/bob_products.html.

2. A metadata training course developed by FGDC and CSC can be found at http://www.csc.noaa.gov/metadata/curriculum/ .

3. USGS, Metadata in plain language, found at http://geology.usgs.gov/tools/metadata/tools/doc/ctc/.

2. How are dates formatted in metadata records?

The following is a synopsis of the information found in an FGDC FAQ on this topic:

A.D. Era to December 31, 9999 A.D.:
YYYY for years;
YYYYMM for month of a year, and
YYYYMMDD for a day of the year

B.C. Era to 9999 B.C.:
bcYYYY for years,
bcYYYYMM for month of a year, and
bcYYYYMMDD for a day of the year

B.C. Era before 9999 B.C.: ccYYYYYYY

A.D. Era after 9999 A.D.: cdYYYYYYY

3. What is the difference between the Online Linkage tag and the Network Resource Name tag?

The Online Linkage tag (8.10 Online Linkage - under 1.1 Citation) refers to the name of a data set on the network, while the Network Resource Name (6.4.2.2.1.1.1.1 Network Resource Name) is the name of the file or service from which the data set can be obtained from a distributor.

The FGDC standard, in the FAQs, states:

FAQ: What is a Network Resource Name?

A: The name of the data set on the network. When appropriate, Uniform Resource Locators (URL) should be provided.

FAQ: What is the difference between the Network Resource Name and the Online Linkage (8.10) data element?

A: The Network Resource Name is the name of the file or service from which the data set can be obtained from a distributor. Different distributors that provide online access to a data set probably would do so from different sites. The Online Linkage is the name of the file or service maintained by the originator (when used with "Citation" (1.1)) or the name of the file or service from which the data set was obtained (when used with "Source Citation" (2.5.5.1)).

(end of FGDC FAQ)

For CoRIS both the Online Linkage and the Network Resource Name can be used to define the location of the data. Wherever possible, the URL where the data can be obtained should be found in the Network Resource Name. As described in the FAQ, the Online Linkage should be the location of the data as provided by the originator, and the Network Resource Name should be used for the location where the data can currently be obtained. For example, if the data are copied from its original location to an archive, the Online Linkage should contain the original location and the Network Resource Name should contain the location in the archive.

In general, both Online Linkage and Network Resource Name should be URLs. Information about other textual information regarding ways to obtain the data can be place in 6.4.2.2.1.2, Access Instructions.

As part of data discovery, the CoRIS software will provide access to all the URLs found in both the Online Linkage and the Network Resource Name tags. The URLs will be ordered with Network Resource Name URLs first, followed by Online Linkage URLs.

4. What URL should be provided for the data?

The URL provided should link either directly to the data or to a web page that is as close as possible to the data, accompanied by access instructions. Linking to the home page of a program or organization will necessitate further searching on the part of the user.

5. How are parent/child metadata implemented in CoRIS?

Parent/child metadata are implemented using the following approach:

1. First, a parent metadata record is created. This should be a valid FGDC metadata record, meaning that all applicable fields need to be specified, even those that will be provided as part of the child metadata. These fields will typically be filled with data that describe the entire set of children. For example, geographic bounding coordinates fields will be the bounding coordinates of the total collection of all children.

2. Data for individual children can be provided to CoRIS in the format illustrated below. In the first line, enter "Parent_Title:" followed by the title of the parent metadata. In succeeding lines, enter the FGDC field lables and content for all fields in which child information differs from parent information. CoRIS can accept records in other formats, such as DBF (Data Base Files) or CSV (comma-separated values).

   SAMPLE CHILD METADATA RECORDS

   Parent_Title: NOAA Experimental Satellite Twice-Weekly 50km Coral Bleaching HotSpot Chart (Eastern Hemisphere)
   Publication_Date: 20010605
   Online_Linkage: http://www.osdpd.noaa.gov/PSB/EPS/SST/data/hotspote.6.5.2001.gif
   Beginning_Date: 20010602
   Ending_Date: 20010604
   Browse_Graphic_File_Name: http://www.osdpd.noaa.gov/PSB/EPS/SST/data/hotspote.6.5.2001.gif
   Network_Resource_Name: http://www.osdpd.noaa.gov/PSB/EPS/SST/data/hotspote.6.5.2001.gif
   ---
   Parent_Title: NOAA Experimental Satellite Twice-Weekly 50km Coral Bleaching HotSpot Chart (Eastern Hemisphere)
   Publication_Date: 20010609
   Online_Linkage: http://www.osdpd.noaa.gov/PSB/EPS/SST/data/hotspote.6.8.2001.gif
   Beginning_Date: 20010605
   Ending_Date: 20010608
   Browse_Graphic_File_Name: http://www.osdpd.noaa.gov/PSB/EPS/SST/data/hotspote.6.8.2001.gif
   Network_Resource_Name: http://www.osdpd.noaa.gov/PSB/EPS/SST/data/hotspote.6.8.2001.gif
   ---
   etc. for each child

   This example is from a data set in which children differ from each other in the beginning and ending dates, and also in publication date and linkages. Please include in child records only the fields that differ from the parent record. If the variance is in geographic positions,

then include those appropriate fields rather than date fields. If the variance is in both position and date, then include both. Please separate children with a line of hyphen "-----" characters; the number of hyphens does not matter.

3. Documention should be provided that describes the mapping of the tag and/or column format of the children to the elements in the parent.

Once this information has been provided and loaded into CoRIS, CoRIS will operate as if each child had been created as a parent record, with the appropriate fields substituted for each of the children. This improves the user's chance of finding the specific data being sought.

Appendix A. Sample Metadata Records

Sample 1

This sample is an abbreviated form of a metadata file that includes more complete information than is shown here. It was abbreviated to show the essential elements for CoRIS, plus a few optional fields, to make it interesting.

IDENTIFICATION_INFORMATION:
Citation:
Citation_Information:
Originator: NOAA Coral Reef Watch Program
NOAA National Environmental Satellite Data and Information Service
Publication_Date: 20010602
Title: NOAA Experimental Satellite Twice-Weekly 50km Coral Reef Bleaching HotSpot Chart (Eastern Hemisphere)
Edition: One
Geospatial_Data_Presentation_Form: remote sensing image
Publication_Information:
Publication_Place: Suitland, Maryland, USA
Publisher: NOAA Coral Reef Watch Program
Online_Linkage: http://www.osdpd.noaa.gov/PSB/EPS/SST/data/hotspote.6.2.2001.gif
Description:
Abstract:
This product is the graphic display of an experimental satellite twice-weekly Coral Reef Bleaching HotSpots field of the Eastern Hemisphere at 50km resolution. The Coral Reef Bleaching HotSpot is a special type of sea surface temperature anomaly and is the difference of the sea surface temperature compared to a static SST climatology called Maximum Monthly Mean SST Climatology (MMMSST) that serves as a coral reef bleaching related threshold. Only the positive HotSpot anomalies are highlighted in the chart.
Experimental satellite twice-weekly 50km nighttime sea surface temperature (SST) field derived from satellite remotely sensed data from Advanced Very High Resolution Radiometer (AVHRR) carried on NOAA's Polar Orbiting Environmental Satellite (POES), NOAA-16, is used to derive this Coral Reef Bleaching HotSpot product. This chart and the corresponding sea surface temperature field are archived copies of the near real-time products produced twice-weekly.
Nighttime SST observations are used for producing the product to eliminate the diurnal variation caused by diurnal solar heating at the sea surface (primarily at the "skin" interface, 10-20 µm). More conservative assessment and prediction can be made from nighttime SST observations. For the same reason and consistency the MMMSST climatology used is also derived from nighttime SST.
The product is an archived copy of HotSpot charts produced twice-weekly in a near real-time fashion on every Tuesday and Saturday as the corresponding SST field does. The AVHRR-derived SST observations from the previous Saturday through the previous Monday are used for updating the SST field produced on Tuesdays and the observations from the previous Tuesday through the previous Friday are for Saturdays. For a twice-weekly period, at the pixels where no observation from the period due to cloud cover or other quality controls are available for updating SST values, the SSTs from the previous twice-weekly SST field at the corresponding pixels are processed to estimate the SST values at that time. As a result, complete twice-weekly SST field and Coral Reef bleaching HotSpot field are always presented.

Purpose:
The product was primarily developed as an NOAA Coral Reef Watch Program's thermally-induced coral reef bleaching early warning and assessment product along with other products including SST, SST anomaly, Degree Heating Weeks, Tropical Coral Bleaching Indices, and SST time series.
Products are intended for federal, state, and local government environmental decision makers, researchers, educators, resource managers, recreational users, and all others who are interested in it.

Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 20010529
Ending_Date: 20010601
Currentness_Reference: publication date

Status:
Progress: Complete
Maintenance_and_Update_Frequency: none planned

Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: 0.0
East_Bounding_Coordinate: 180.0
North_Bounding_Coordinate: 45.0
South_Bounding_Coordinate: -45.0

Keywords:
Theme:
Theme_Keyword_Thesaurus: CoRIS Keyword Thesaurus
Theme_Keyword: CoRIS
Theme_Keyword: Coral Reef Watch
Theme_Keyword: remote sensing
Theme_Keyword: satellite
Theme_Keyword: POES
Theme_Keyword: Polar Orbiting Environmental Satellite
Theme_Keyword: NOAA-16
Theme_Keyword: image
Theme_Keyword: map
Theme_Keyword: chart
Theme_Keyword: AVHRR
Theme_Keyword: SST
Theme_Keyword: sea surface
Theme_Keyword: sea surface temperature
Theme_Keyword: HotSpot
Theme_Keyword: coral reef bleaching HotSpot
Theme_Keyword: oceanography
Theme_Keyword: coral reef
Theme_Keyword: bleaching
Theme_Keyword: monitoring
Theme_Keyword: temperature
Theme_Keyword: thermal
Theme_Keyword: stress
Theme_Keyword: NOAA
Place:
Place_Keyword_Thesaurus: CoRIS Keyword Thesaurus
Place_Keyword: eastern hemisphere
Place_Keyword: Pacific Ocean
Place_Keyword: Atlantic Ocean
Place_Keyword: Indian Ocean

Temporal:
Temporal_Keyword_Thesaurus: none
Temporal_Keyword: none
Access_Constraints: none
Use_Constraints:
Not intended for legal use. Data may contain inaccuracies due to clouded or mixed pixels.
Point_of_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Person: Alan E. Strong, NOAA Coral Reef Watch Program Manager
Contact_Organization: NOAA Coral Reef Watch Program
Contact_Address:
Address_Type: mailing and physical address
Address: NOAA E/RA3, Room 711, 5200 Auth Road
City: Camp Springs
State_or_Province: Maryland
Postal_Code: 20746
Country: USA
Contact_Voice_Telephone: 301-763-8102 ext 170
Contact_Facsimile_Telephone: 301-763-8108
Contact_Electronic_Mail_Address: Alan.E.Strong@noaa.gov
Browse_Graphic:
Browse_Graphic_File_Name:
http://www.osdpd.noaa.gov/PSB/EPS/SST/data/hotspote.6.2.2001.gif
Browse_Graphic_File_Description:
The chart is the full-size archived "NOAA Experimental Satellite Twice-Weekly 50km Coral Reef Bleaching HotSpot Chart (Eastern Hemisphere)
Browse_Graphic_File_Type: GIF
DISTRIBUTION_INFORMATION
Distributor:
Contact_Information:
Contact_Organization_Primary:
Contact_Person: Alan E. Strong, NOAA Coral Reef Watch Program Manager
Contact_Organization: NOAA Coral Reef Watch Program
Contact_Address:
Address_Type: mailing and physical address
Address: NOAA E/RA3, Room 711, 5200 Auth Road
City: Camp Springs
State_or_Province: Maryland
Postal_Code: 20746
Country: USA
Contact_Voice_Telephone: 301-763-8102 ext 170
Contact_Facsimile_Telephone: 301-763-8108
Contact_Electronic_Mail_Address: Alan.E.Strong@noaa.gov
Distribution_Liability:
NOAA makes no warranty regarding these data, expressed or implied, nor does the fact of distribution constitute such a warranty. NOAA cannot assume liability for any damages caused by any errors or omissions in these data, nor as a result of the failure of these data to function on a particular system.
Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Format_Name: GIF format
Format_Information_Content: Coral Reef Bleaching HotSpot
Transfer_Size: 46KB

Digital_Transfer_Option:
Online_Option:
Computer_Contact_Information:
Network_Address:
Network_Resource_Name:
http://www.osdpd.noaa.gov/PSB/EPS/SST/data/hotspote.6.2.2001.gif
Network_Resource_Name:
ftp, contact the distributor for details
Network_Resource_Name:
email, contact the distributor for details
Offline_Option:
Offline_Media: CD-ROM
Recording_Format: none
Compatibility_Information:
The GIF format is recognized by most graphics applications.
Fees: none
Ordering_Instructions:
The product in GIF format may be downloaded from the Web site or obtained from the distributor.
METADATA_REFERENCE_INFORMATION
Metadata_Date: 20010602
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Person: Alan E. Strong, NOAA Coral Reef Watch Program Manager
Contact_Organization: NOAA Coral Reef Watch Program
Contact_Address:
Address_Type: mailing and physical address
Address: NOAA E/RA3, Room 711, 5200 Auth Road
City: Camp Springs
State_or_Province: Maryland
Postal_Code: 20746
Country: USA
Contact_Voice_Telephone: 301-763-8102 ext 170
Contact_Facsimile_Telephone: 301-763-8108
Contact_Electronic_Mail_Address: Alan.E.Strong@noaa.gov
Metadata_Standard_Name: FGDC CSDGM
Metadata_Standard_Version: FGDC-STD-001-1998

Sample 2

This is a sample metadata record showing use of the NBII taxonomy elements.

Identification_Information:
  Citation:
    Citation_Information:
      Originator: Hawaiian Electric Company Environmental Department
      Publication_Date: 19970228
      Publication_Time: Unknown
      Title:
        Annual Report: Kahe Generating Station. NPDES
        Monitoring Program for 1996
      Geospatial_Data_Presentation_Form: document
      Publication_Information:
        Publication_Place: Honolulu, Hawaii
        Publisher: HECO Environmental Department
      Other_Citation_Details:
        Prepared for: Environmental Department Hawaiian
          Electric Company P. O. Box 2750 Honolulu, Hawaii
          96840
        Prepared by: AECOS Inc. 970 N. Kalaheo
          Ave., Suite C300 Kailua, Hawaii 96734 under
          annual reporting requirements of National
          Pollutant Discharge Elimination System (NPDES)
          Permit HI0000019, Section C.5. The originator
          format of these data and redundant text files are
          archived at the NODC under Accession # 9900012.
  Description:
    Abstract:
      The Hawaiian Electric Company Inc. (HECO), under requirements of National Pollutant Discharge Elimination System (NPDES) Permit HI0000019, Section C.5, annually conducts and reports results of a monitoring program for waters receiving effluent from the Kahe Generating Station, O'ahu, Hawaii. This report presents results of monitoring conducted during 1996 for water temperature, sand entrainment, and coral coverage. Kahe discharge temperature elevations above the adjusted intake temperature did not exceed the allowable NPDES daily discharge limit of 8.4°C (15.0°F) during 1996. [remainder deleted]
    Purpose:
      National Pollutant Discharge Elimination System (NPDES) permit HI0000019 authorizes HECO to discharge waste water from the Kahe Generating Station. A provision of this permit is that HECO follow a marine monitoring program and documents marine effects of cooling-water discharge from Kahe Generating Station Units 1 through 6. Specific studies covered under this program include monitoring of temperature elevations of thermal effluents, quantities of sediment entrainment and throughput, and reef coral communities. An annual report of the data, analysis, and findings of these monitoring studies is submitted to the State Department of Health (DOH) Director and Environmental Protection Agency (EPA) Regional Administrator no later than March 1 of each year.

    Supplemental_Information:
      The 1996 daily discharge and unadjusted intake
      temperature data log (Appendix B of this report)
      is provided under NODC Accession # 9900021, 'Kahe
      Generating Station 1996 Temperature Data.xls'

Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 19960101
Ending_Date: 19961231
Currentness_Reference: Ground condition
Status:
Progress: Complete
Maintenance_and_Update_Frequency: Annually
Spatial_Domain:
Description_of_Geographic_Extent:
The Kahe Generating Station is in a valley between Kahe Point and Nanakuli on the Wai`anae coast of O'ahu, Hawaii, approximately 18 miles west of Honolulu. Point of discharge is approximately 250 m (820 ft) offshore.
Bounding_Coordinates:
West_Bounding_Coordinate: -158.1353
East_Bounding_Coordinate: -158.1353
North_Bounding_Coordinate: 21.35667
South_Bounding_Coordinate: 21.35667
Keywords:
Theme:
Theme_Keyword_Thesaurus: CoRis Theme Keyword Thesaurus Version 1.0
Theme_Keyword: earth science
Theme_Keyword: biosphere
Theme_Keyword: zoology
Theme_Keyword: corals
Theme_Keyword: coral reefs
Theme_Keyword: coral mortality
Theme_Keyword: coral growth
Theme_Keyword: assessment
Theme_Keyword: change analysis
Theme_Keyword: Coastal studies
Theme_Keyword: Coral reef damage assessment - biological
Theme_Keyword: Hard coral cover - live percentage
Theme_Keyword: Impact assessment
Theme_Keyword: Sediment throughput
Theme_Keyword: Water temperature change
Theme_Keyword: Sand movement
Theme_Keyword: Numeric data sets
Theme_Keyword: Numeric data sets - oceanographic
Theme_Keyword: Numeric data sets - benthic
Theme_Keyword: Numeric data sets - biology
Place:
Place_Keyword_Thesaurus: CoRis Keyword Thesaurus Version 1.0
Place_Keyword: U.S. - Hawaii - Oahu
Place_Keyword: Oahu - Wai`anae coast
Taxonomy:
Taxonomic_Classification:
Taxon_Rank_Name: Kingdom
Taxon_Rank_Value: Animalia
Taxonomic_Classification:
Taxon_Rank_Name: Division
Taxon_Rank_Value: Cnidaria
Taxonomic_Classification:
Taxon_Rank_Name: Class
Taxon_Rank_Value: Anthozoa

```
        Taxonomic_Classification:
          Taxon_Rank_Name: Order
          Taxon_Rank_Value: Scleractinia
          Applicable_Common_Name: stony corals
          Taxonomic_Classification:
            Taxon_Rank_Name: Family
            Taxon_Rank_Value: Poritidae
            Applicable_Common_Name: stony corals
            Taxonomic_Classification:
              Taxon_Rank_Name: Genus
              Taxon_Rank_Value: Porites
              Applicable_Common_Name: stony corals
              Taxonomic_Classification:
                Taxon_Rank_Name: Species
                Taxon_Rank_Value: Porites lobata
                Applicable_Common_Name: stony corals
          Taxonomic_Classification:
            Taxon_Rank_Name: Family
            Taxon_Rank_Value: Pocilloporidae
            Applicable_Common_Name: stony corals
            Taxonomic_Classification:
              Taxon_Rank_Name: Genus
              Taxon_Rank_Value: Pocillopora
              Applicable_Common_Name: stony corals
              Taxonomic_Classification:
                Taxon_Rank_Name: Species
                Taxon_Rank_Value: Pocillopora meandrina
                Applicable_Common_Name: stony corals
          Taxonomic_Classification:
            Taxon_Rank_Name: Family
            Taxon_Rank_Value: Acroporidae
            Applicable_Common_Name: stony corals
            Taxonomic_Classification:
              Taxon_Rank_Name: Genus
              Taxon_Rank_Value: Montipora
              Applicable_Common_Name: stony corals
              Taxonomic_Classification:
                Taxon_Rank_Name: Species
                Taxon_Rank_Value: Montipora patula*
                Applicable_Common_Name: stony corals
  Access_Constraints: None
  Use_Constraints: Dataset credit required
  Point_of_Contact:
    Contact_Information:
      Contact_Organization_Primary:
        Contact_Organization: NOAA/National Oceanographic Data Center
      Contact_Position: NODC User Services Group Leader
      Contact_Address:
        Address_Type: Mailing and physical address
        Address: SSMC3 Fourth Floor
        Address: 1315 East West Highway
        City: Silver Spring
        State_or_Province: Maryland
        Postal_Code: 20910-3282
        Country: USA
      Contact_Voice_Telephone: 301-713-3277
```

Contact_Facsimile_Telephone: 301-713-3302
Contact_Electronic_Mail_Address: services@nodc.noaa.gov
Hours_of_Service: 8:00 a.m. to 4:00 p.m. Monday Through Friday
Contact_Instructions: Phone/FAX/e-mail
Data_Set_Credit: Hawaiian Electric Company Environmental Department
Security_Information:
Security_Classification_System: None
Security_Classification: None
Security_Handling_Description: None
Native_Data_Set_Environment:
MS Word 6.0; 1.4 MB;'Kahe Generating Station NPDES
Annual Report for 1996.doc; redundant text files
Cross_Reference:
Citation_Information:
Originator:
Hawaiian Electric Company - Environmental
Department
Publication_Date: 19960228
Title:
Annual report: Kahe Generating Station, NPDES
Monitoring Program for 1995
Publication_Information:
Publication_Place: Honolulu, Hawaii
Publisher: HECO Environmental Department
Data_Quality_Information:
Logical_Consistency_Report: see methods section
Completeness_Report: see methods section
Lineage:
Methodology:
Methodology_Type: Field
Methodology_Identifier:
Methodology_Keyword_Thesaurus: Monitoring assessment
Methodology_Keyword: temperature monitoring
Methodology_Keyword: sediment throughput
Methodology_Keyword: coral coverage monitoring
Methodology_Keyword: quadrat analysis
Methodology_Keyword: photographic analysis
Methodology_Description:
Since January 1, 1986, HECO has used adjusted intake water temperatures as the reference against which temperature elevations of the thermal effluent are measured. Intake temperatures are adjusted downward by 0.42 C° to determine the reference temperature. Based on over 10 years of temperature records collected at an ambient temperature control station, it was determined that intake temperatures exceeded nearshore ambient bottom temperatures by this amount. Daily records were kept of maximum, minimum, mean effluent, and mean influent temperatures for 1996. Intake and discharge temperatures were recorded continuously using a Foxboro ERB strip chart recorder and Dynatherm* resistance bulbs. The intake temperature resistance bulb is located in Unit 1-4 forebay and the discharge temperature resistance bulb is located in the transition basin before the discharge pipe. The present ambient temperature collection method provides a sensitive and readily available range from which temperature elevations above ambient can be compared. [remainder deleted]
Process_Step:
Process_Description: see methods section
Process_Date: 19961231
Taxonomic_System:
Classification_System_or_Authority:
Classification_System_Citation:

Citation_Information:
Originator: USDA, NOAA, USGS, EPA, USFWS, Smithsonian, and other U.S. and Canadian agencies
Publication_Date: 20010125
Title: Integrated Taxonomic Information System (ITIS)
Online_Linkage: http://www.itis.usda.gov/index.html
Distribution_Information:
Distributor:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: NOAA/National Oceanographic Data Center
Contact_Position: NODC User Services Group Leader
Contact_Address:
Address_Type: Mailing and physical address
Address: SSMC3 Fourth Floor
Address: 1315 East West Highway
City: Silver Spring
State_or_Province: Maryland
Postal_Code: 20910-3282
Country: USA
Contact_Voice_Telephone: 301-713-3277
Contact_Facsimile_Telephone: 301-713-3302
Contact_Electronic_Mail_Address: services@nodc.noaa.gov
Hours_of_Service: 8:00 a.m. to 4:00 p.m. Monday Through Friday
Contact_Instructions: Phone/FAX/e-mail
Resource_Description: NODC Accession # 9900012
Distribution_Liability:
NOAA makes no warranty regarding these data,
expressed or implied, nor does the fact of
distribution constitute such a warranty. NOAA and
NODC cannot assume liability for any damages
caused by any errors or omissions in these data,
nor as a result of the failure of these data to
function on a particular system.
Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Format_Name: FTP (File Transfer Protocol)
Digital_Transfer_Option:
Online_Option:
Computer_Contact_Information:
Network_Address:
Network_Resource_Name: http://www.nodc.noaa.gov
Access_Instructions:
http://www.nodc.noaa.gov; download data via the
"NODC Data Direct" section of the NODC website
(#9900012). Specific NODC project data (coral
reef data, World Ocean Database) may also be
directly downloaded from project sections of the
NODC website.
Online_Computer_and_Operating_System: Internet browser; FTP capabilities
Fees: None
Ordering_Instructions:
http://www.nodc.noaa.gov; download data via the
"NODC Data Direct" section of the NODC website
(#9900012). Specific NODC project data (coral

reef data, World Ocean Database) may also be
directly downloaded from project sections of the
NODC website.
Turnaround: 24 hours or less (via direct Internet download)
Custom_Order_Process:
Contact the NODC User Services Group via
phone/FAX/E-mail: services@nodc.noaa.gov
Technical_Prerequisites:
Internet browser; FTP capabilities; Microsoft Word
6.0 recommended
Metadata_Reference_Information:
Metadata_Date: 20011005
Metadata_Review_Date: 20011025
Metadata_Future_Review_Date: 20021005
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: NOAA/National Oceanographic Data Center
Contact_Person: Amanda Lowe
Contact_Address:
Address_Type: mailing address
Address:
c/o NODC E/OC1
SSMC3, 4th Floor
1315 East-West Highway
City: Silver Spring
State_or_Province: Maryland
Postal_Code: 20910
Contact_Voice_Telephone: 301-713-3281
Contact_Electronic_Mail_Address: ahl93@yahoo.com
Hours_of_Service: 8:00 a.m. to 4:00 p.m. Monday Through Friday
Contact_Instructions: E-mail; phone/mail c/o NODC User Services or NODC Coral Reef
Team
Metadata_Standard_Name: NBII Content Standard for National Biological Information
Infrastructure Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Access_Constraints: None
Metadata_Use_Constraints: None
Metadata_Security_Information:
Metadata_Security_Classification_System: None
Metadata_Security_Classification: Unclassified
Metadata_Security_Handling_Description: None

Appendix B. ASCII Template for CoRIS Metadata

CoRIS metadata template, with no comments, can be copied and used to complete metadata information for CoRIS. See Instructions for completing metadata fields for specific guidance.

```
Metadata:
  Identification_Information:
    Citation:
      Citation_Information:
        Originator:
        Publication_Date:
        Title:
        Online_Linkage:
    Description:
      Abstract:
      Purpose:
    Time_Period_of_Content:
      Time_Period_Information:
        Single_Date/Time:
          Calendar_Date:
        Multiple_Dates/Times:
          Single_Date/Time:
            Calendar_Date:
        Range_of_Dates/Times:
          Beginning_Date:
          Ending_Date:
      Currentness_Reference:
    Status:
      Progress:
      Maintenance_and_Update_Frequency:
    Spatial_Domain:
      Bounding_Coordinates:
        West_Bounding_Coordinate:
        East_Bounding_Coordinate:
        North_Bounding_Coordinate:
        South_Bounding_Coordinate:
    Keywords:
      Theme:
        Theme_Keyword_Thesaurus:
        Theme_Keyword:
    Access_Constraints:
    Use_Constraints:
    Browse_Graphic:
      Browse_Graphic_File_Name:
      Browse_Graphic_File_Description:
      Browse_Graphic_File_Type:
  Distribution_Information:
    Distributor:
      Contact_Information:
        Contact_Person_Primary:
          Contact_Person:
        Contact_Organization_Primary:
          Contact_Organization:
        Contact_Address:
          Address_Type:
```

```
        Address:
        City:
        State_or_Province:
        Postal_Code:
      Contact_Voice_Telephone:
  Distribution_Liability:
  Standard_Order_Process:
    Non-digital_Form:
    Digital_Form:
      Digital_Transfer_Information:
        Format_Name:
      Digital_Transfer_Option:
        Online_Option:
          Computer_Contact_Information:
            Network_Address:
              Network_Resource_Name:
        Offline_Option:
          Offline_Media:
          Recording_Format:
    Fees:
    Ordering_Instructions:
Metadata_Reference_Information:
  Metadata_Date:
  Metadata_Contact:
    Contact_Information:
      Contact_Person_Primary:
        Contact_Person:
      Contact_Organization_Primary:
        Contact_Organization:
      Contact_Address:
        Address_Type:
        Address:
        City:
        State_or_Province:
        Postal_Code:
      Contact_Voice_Telephone:
  Metadata_Standard_Name:
  Metadata_Standard_Version:
```

Appendix C. ASCII Template for full FGDC Metadata

This template includes the complete set of FGDC metadata fields, and is provided for those who may want to use specific sections in addition to those required for CoRIS. For element definitions and domain values, please refer to the http://www.fgdc.gov/metadata/meta_workbook.html (in Adobe PDF form).

```
Metadata:
  Identification_Information:
    Citation:
      Citation_Information:
        Originator:
        Publication_Date:
        Publication_Time:
        Title:
        Edition:
        Geospatial_Data_Presentation_Form:
        Series_Information:
          Series_Name:
          Issue_Identification:
        Publication_Information:
          Publication_Place:
          Publisher:
        Other_Citation_Details:
        Online_Linkage:
        Larger_Work_Citation:
          Citation_Information:
    Description:
      Abstract:
      Purpose:
    Time_Period_of_Content:
      Time_Period_Information:
        Single_Date/Time:
          Calendar_Date:
          Time_of_Day:
        Multiple_Dates/Times:
          Single_Date/Time:
            Calendar_Date:
            Time_of_Day:
        Range_of_Dates/Times:
          Beginning_Date:
          Beginning_Time:
          Ending_Date:
          Ending_Time:
      Currentness_Reference:
    Status:
      Progress:
      Maintenance_and_Update_Frequency:
    Spatial_Domain:
      Bounding_Coordinates:
        West_Bounding_Coordinate:
        East_Bounding_Coordinate:
        North_Bounding_Coordinate:
        South_Bounding_Coordinate:
```

```
  Data_Set_G-Polygon:
    Data_Set_G-Polygon_Outer_G-Ring:
      G-Ring_Point:
        G-Ring_Latitude:
        G-Ring_Longitude:
      G-Ring:
    Data_Set_G-Polygon_Exclusion_G-Ring:
      G-Ring_Point:
        G-Ring_Latitude:
        G-Ring_Longitude:
      G-Ring:
Keywords:
  Theme:
    Theme_Keyword_Thesaurus:
    Theme_Keyword:
  Place:
    Place_Keyword_Thesaurus:
    Place_Keyword:
  Stratum:
    Stratum_Keyword_Thesaurus:
    Stratum_Keyword:
  Temporal:
    Temporal_Keyword_Thesaurus:
    Temporal_Keyword:
Access_Constraints:
Use_Constraints:
Point_of_Contact:
  Contact_Information:
    Contact_Person_Primary:
      Contact_Person:
      Contact_Organization:
    Contact_Organization_Primary:
      Contact_Organization:
      Contact_Person:
    Contact_Position:
    Contact_Address:
      Address_Type:
      Address:
      City:
      State_or_Province:
      Postal_Code:
      Country:
    Contact_Voice_Telephone:
    Contact_TDD/TTY_Telephone:
    Contact_Facsimile_Telephone:
    Contact_Electronic_Mail_Address:
    Hours_of_Service:
    Contact_Instructions:
Browse_Graphic:
  Browse_Graphic_File_Name:
  Browse_Graphic_File_Description:
  Browse_Graphic_File_Type:
Data_Set_Credit:
Security_Information:
  Security_Classification_System:
  Security_Classification:
  Security_Handling_Description:
```

```
    Native_Data_Set_Environment:
    Cross_Reference:
      Citation_Information:
        Originator:
        Publication_Date:
        Publication_Time:
        Title:
        Edition:
        Geospatial_Data_Presentation_Form:
        Series_Information:
          Series_Name:
          Issue_Identification:
        Publication_Information:
          Publication_Place:
          Publisher:
        Other_Citation_Details:
        Online_Linkage:
        Larger_Work_Citation:
          Citation_Information:
  Data_Quality_Information:
    Attribute_Accuracy:
      Attribute_Accuracy_Report:
      Quantitative_Attribute_Accuracy_Assessment:
        Attribute_Accuracy_Value:
        Attribute_Accuracy_Explanation:
    Logical_Consistency_Report:
    Completeness_Report:
    Positional_Accuracy:
      Horizontal_Positional_Accuracy:
        Horizontal_Positional_Accuracy_Report:
        Quantitative_Horizontal_Positional_Accuracy_Assessment:
          Horizontal_Positional_Accuracy_Value:
          Horizontal_Positional_Accuracy_Explanation:
      Vertical_Positional_Accuracy:
        Vertical_Positional_Accuracy_Report:
        Quantitative_Vertical_Positional_Accuracy_Assessment:
          Vertical_Positional_Accuracy_Value:
          Vertical_Positional_Accuracy_Explanation:
    Lineage:
      Source_Information:
        Source_Citation:
          Citation_Information:
            Originator:
            Publication_Date:
            Publication_Time:
            Title:
            Edition:
            Geospatial_Data_Presentation_Form:
            Series_Information:
              Series_Name:
              Issue_Identification:
            Publication_Information:
              Publication_Place:
              Publisher:
            Other_Citation_Details:
            Online_Linkage:
            Larger_Work_Citation:
```

```
            Citation_Information:
        Source_Scale_Denominator:
        Type_of_Source_Media:
        Source_Time_Period_of_Content:
          Time_Period_Information:
            Single_Date/Time:
              Calendar_Date:
              Time_of_Day:
            Multiple_Dates/Times:
              Single_Date/Time:
                Calendar_Date:
                Time_of_Day:
            Range_of_Dates/Times:
              Beginning_Date:
              Beginning_Time:
              Ending_Date:
              Ending_Time:
          Source_Currentness_Reference:
        Source_Citation_Abbreviation:
        Source_Contribution:
      Process_Step:
        Process_Description:
        Source_Used_Citation_Abbreviation:
        Process_Date:
        Process_Time:
        Source_Produced_Citation_Abbreviation:
        Process_Contact:
          Contact_Information:
            Contact_Person_Primary:
              Contact_Person:
              Contact_Organization:
            Contact_Organization_Primary:
              Contact_Organization:
              Contact_Person:
            Contact_Position:
            Contact_Address:
              Address_Type:
              Address:
              City:
              State_or_Province:
              Postal_Code:
              Country:
            Contact_Voice_Telephone:
            Contact_TDD/TTY_Telephone:
            Contact_Facsimile_Telephone:
            Contact_Electronic_Mail_Address:
            Hours_of_Service:
            Contact_Instructions:
  Cloud_Cover:
Spatial_Data_Organization_Information:
  Indirect_Spatial_Reference:
  Direct_Spatial_Reference_Method:
  Point_and_Vector_Object_Information:
    SDTS_Terms_Description:
      SDTS_Point_and_Vector_Object_Type:
      Point_and_Vector_Object_Count:
    VPF_Terms_Description:
```

```
      VPF_Topology_Level:
      VPF_Point_and_Vector_Object_Information
        VPF_Point_and_Vector_Object_Type:
        Point_and_Vector_Object_Count:
  Raster_Object_Information:
    Raster_Object_Type:
    Row_Count:
    Column_Count:
    Vertical_Count:
Spatial_Reference_Information:
  Horizontal_Coordinate_System_Definition:
    Geographic:
      Latitude_Resolution:
      Longitude_Resolution:
      Geographic_Coordinate_Units:
    Planar:
      Map_Projection:
        Map_Projection_Name:
        Albers_Conical_Equal_Area:
          Standard_Parallel:
          Longitude_of_Central_Meridian:
          Latitude_of_Projection_Origin:
          False_Easting:
          False_Northing:
        Azimuthal_Equidistant:
          Longitude_of_Central_Meridian:
          Latitude_of_Projection_Origin:
          False_Easting:
          False_Northing:
        Equidistant_Conic:
          Standard_Parallel:
          Longitude_of_Central_Meridian:
          Latitude_of_Projection_Origin:
          False_Easting:
          False_Northing:
        Equirectangular:
          Standard_Parallel:
          Longitude_of_Central_Meridian:
          False_Easting:
          False_Northing:
        General_Vertical_Near-sided_Perspective:
          Height_of_Perspective_Point_Above_Surface:
          Longitude_of_Projection_Center:
          Latitude_of_Projection_Center:
          False_Easting:
          False_Northing:
        Gnomonic:
          Longitude_of_Projection_Center:
          Latitude_of_Projection_Center:
          False_Easting:
          False_Northing:
        Lambert_Azimuthal_Equal_Area:
          Longitude_of_Projection_Center:
          Latitude_of_Projection_Center:
          False_Easting:
          False_Northing:
        Lambert_Conformal_Conic:
```

```
      Standard_Parallel:
      Longitude_of_Central_Meridian:
      Latitude_of_Projection_Origin:
      False_Easting:
      False_Northing:
    Mercator:
      Standard_Parallel:
      Scale_Factor_at_Equator:
      Longitude_of_Central_Meridian:
      False_Easting:
      False_Northing:
    Modified_Stereographic_for_Alaska:
      False_Easting:
      False_Northing:
    Miller_Cylindrical:
      Longitude_of_Central_Meridian:
      False_Easting:
      False_Northing:
    Oblique_Mercator:
      Scale_Factor_at_Center_Line:
      Oblique_Line_Azimuth:
        Azimuthal_Angle:
        Azimuth_Measure_Point_Longitude:
      Oblique_Line_Point:
        Oblique_Line_Latitude:
        Oblique_Line_Longitude:
      Latitude_of_Projection_Origin:
      False_Easting:
      False_Northing:
    Orthographic:
      Longitude_of_Projection_Center:
      Latitude_of_Projection_Center:
      False_Easting:
      False_Northing:
    Polar_Stereographic:
      Straight-Vertical_Longitude_from_Pole:
      Standard_Parallel:
      Scale_Factor_at_Projection_Origin:
      False_Easting:
      False_Northing:
    Polyconic:
      Longitude_of_Central_Meridian:
      Latitude_of_Projection_Origin:
      False_Easting:
      False_Northing:
    Robinson:
      Longitude_of_Projection_Center:
      False_Easting:
      False_Northing:
    Sinusoidal:
      Longitude_of_Central_Meridian:
      False_Easting:
      False_Northing:
    Space_Oblique_Mercator_(Landsat):
      Landsat_Number:
      Path_Number:
      False_Easting:
```

```
      False_Northing:
    Stereographic:
      Longitude_of_Projection_Center:
      Latitude_of_Projection_Center:
      False_Easting:
      False_Northing:
    Transverse_Mercator:
      Scale_Factor_at_Central_Meridian:
      Longitude_of_Central_Meridian:
      Latitude_of_Projection_Origin:
      False_Easting:
      False_Northing:
    van_der_Grinten:
      Longitude_of_Central_Meridian:
      False_Easting:
      False_Northing:
    Map_Projection_Parameters:
  Grid_Coordinate_System:
    Grid_Coordinate_System_Name:
    Universal_Transverse_Mercator:
      UTM_Zone_Number:
      Transverse_Mercator:
        Scale_Factor_at_Central_Meridian:
        Longitude_of_Central_Meridian:
        Latitude_of_Projection_Origin:
        False_Easting:
        False_Northing:
    Universal_Polar_Stereographic:
      UPS_Zone_Identifier:
      Polar_Stereographic:
        Straight-Vertical_Longitude_from_Pole:
        Standard_Parallel:
        Scale_Factor_at_Projection_Origin:
        False_Easting:
        False_Northing:
    State_Plane_Coordinate_System:
      SPCS_Zone_Identifier:
      Lambert_Conformal_Conic:
        Standard_Parallel:
        Longitude_of_Central_Meridian:
        Latitude_of_Projection_Origin:
        False_Easting:
        False_Northing:
      Transverse_Mercator:
        Scale_Factor_at_Central_Meridian:
        Longitude_of_Central_Meridian:
        Latitude_of_Projection_Origin:
        False_Easting:
        False_Northing:
      Oblique_Mercator:
        Scale_Factor_at_Center_Line:
        Oblique_Line_Azimuth:
          Azimuthal_Angle:
          Azimuth_Measure_Point_Longitude:
        Oblique_Line_Point:
          Oblique_Line_Latitude:
          Oblique_Line_Longitude:
```

```
            Latitude_of_Projection_Origin:
            False_Easting:
            False_Northing:
          Polyconic:
            Longitude_of_Central_Meridian:
            Latitude_of_Projection_Origin:
            False_Easting:
            False_Northing:
        ARC_Coordinate_System:
          ARC_System_Zone_Identifier:
          Equirectangular:
            Standard_Parallel:
            Longitude_of_Central_Meridian:
            False_Easting:
            False_Northing:
          Azimuthal_Equidistant:
            Longitude_of_Central_Meridian:
            Latitude_of_Projection_Origin:
            False_Easting:
            False_Northing:
        Other_Grid_System's_Definition:
      Local_Planar:
        Local_Planar_Description:
        Local_Planar_Georeference_Information:
      Planar_Coordinate_Information:
        Planar_Coordinate_Encoding_Method:
        Coordinate_Representation:
          Abscissa_Resolution:
          Ordinate_Resolution:
        Distance_and_Bearing_Representation:
          Distance_Resolution:
          Bearing_Resolution:
          Bearing_Units:
          Bearing_Reference_Direction:
          Bearing_Reference_Meridian:
        Planar_Distance_Units:
    Local:
      Local_Description:
      Local_Georeference_Information:
    Geodetic_Model:
      Horizontal_Datum_Name:
      Ellipsoid_Name:
      Semi-major_Axis:
      Denominator_of_Flattening_Ratio:
  Vertical_Coordinate_System_Definition:
    Altitude_System_Definition:
      Altitude_Datum_Name:
      Altitude_Resolution:
      Altitude_Distance_Units:
      Altitude_Encoding_Method:
    Depth_System_Definition:
      Depth_Datum_Name:
      Depth_Resolution:
      Depth_Distance_Units:
      Depth_Encoding_Method:
Entity_and_Attribute_Information:
  Detailed_Description:
```

```
      Entity_Type:
        Entity_Type_Label:
        Entity_Type_Definition:
        Entity_Type_Definition_Source:
      Attribute:
        Attribute_Label:
        Attribute_Definition:
        Attribute_Definition_Source:
        Attribute_Domain_Values:
          Enumerated_Domain:
            Enumerated_Domain_Value:
            Enumerated_Domain_Value_Definition:
            Enumerated_Domain_Value_Definition_Source:
            Attribute:
          Range_Domain:
            Range_Domain_Minimum:
            Range_Domain_Maximum:
            Attribute_Units_of_Measure:
            Attribute_Measurement_Resolution:
            Attribute:
          Codeset_Domain:
            Codeset_Name:
            Codeset_Source:
          Unrepresentable_Domain:
        Beginning_Date_of_Attribute_Values:
        Ending_Date_of_Attribute_Values:
        Attribute_Value_Accuracy_Information:
          Attribute_Value_Accuracy:
          Attribute_Value_Accuracy_Explanation:
        Attribute_Measurement_Frequency:
    Overview_Description:
      Entity_and_Attribute_Overview:
      Entity_and_Attribute_Detail_Citation:
  Distribution_Information:
    Distributor:
      Contact_Information:
        Contact_Person_Primary:
          Contact_Person:
          Contact_Organization:
        Contact_Organization_Primary:
          Contact_Organization:
          Contact_Person:
        Contact_Position:
        Contact_Address:
          Address_Type:
          Address:
          City:
          State_or_Province:
          Postal_Code:
          Country:
        Contact_Voice_Telephone:
        Contact_TDD/TTY_Telephone:
        Contact_Facsimile_Telephone:
        Contact_Electronic_Mail_Address:
        Hours_of_Service:
        Contact_Instructions:
    Resource_Description:
```

```
    Distribution_Liability:
    Standard_Order_Process:
      Non-digital_Form:
      Digital_Form:
        Digital_Transfer_Information:
          Format_Name:
          Format_Version_Number:
          Format_Version_Date:
          Format_Specification:
          Format_Information_Content:
          File_Decompression_Technique:
          Transfer_Size:
        Digital_Transfer_Option:
          Online_Option:
            Computer_Contact_Information:
              Network_Address:
                Network_Resource_Name:
              Dialup_Instructions:
                Lowest_BPS:
                Highest_BPS:
                Number_DataBits:
                Number_StopBits:
                Parity:
                Compression_Support:
                Dialup_Telephone:
                Dialup_File_Name:
            Access_Instructions:
            Online_Computer_and_Operating_System:
          Offline_Option:
            Offline_Media:
            Recording_Capacity:
              Recording_Density:
              Recording_Density_Units:
            Recording_Format:
            Compatibility_Information:
      Fees:
      Ordering_Instructions:
      Turnaround:
    Custom_Order_Process:
    Technical_Prerequisites:
    Available_Time_Period:
      Time_Period_Information:
        Single_Date/Time:
          Calendar_Date:
          Time_of_Day:
        Multiple_Dates/Times:
          Single_Date/Time:
            Calendar_Date:
            Time_of_Day:
        Range_of_Dates/Times:
          Beginning_Date:
          Beginning_Time:
          Ending_Date:
          Ending_Time:
  Metadata_Reference_Information:
    Metadata_Date:
    Metadata_Review_Date:
```

```
Metadata_Future_Review_Date:
Metadata_Contact:
  Contact_Information:
    Contact_Person_Primary:
      Contact_Person:
      Contact_Organization:
    Contact_Organization_Primary:
      Contact_Organization:
      Contact_Person:
    Contact_Position:
    Contact_Address:
      Address_Type:
      Address:
      City:
      State_or_Province:
      Postal_Code:
      Country:
    Contact_Voice_Telephone:
    Contact_TDD/TTY_Telephone:
    Contact_Facsimile_Telephone:
    Contact_Electronic_Mail_Address:
    Hours_of_Service:
    Contact_Instructions:
Metadata_Standard_Name:
Metadata_Standard_Version:
Metadata_Time_Convention:
Metadata_Access_Constraints:
Metadata_Use_Constraints:
Metadata_Security_Information:
  Metadata_Security_Classification_System:
  Metadata_Security_Classification:
  Metadata_Security_Handling_Description:
Metadata_Extensions:
  Online_Linkage:
  Profile_Name:
```

Appendix D. Informal Review of Metadata Software

A comprehensive summary of metadata development tools, dated October 2000, is available online at the Federal Geographic Data Committee website at:

http://www.fgdc.gov/metadata/toollist/metatool.html

A web-based metadata entry and service system is available here, as well as information on, and latest versions of, CNS and MP parsers utilized in the generation of .XML files.

1) SMMS (Spatial Metadata Management System)
Availability: Commercial software, see URL at http://www.intergraph.com/gis/smms/

Comments: Powerful commercial package incorporating FGDC/NBII elements, fairly user-intuitive with comfortable interface (matches or exceeds Metamaker in capabilities, reportedly under consideration by the U.S. Department of Interior as a standard package). Note: Ownership of SMMS has recently changed; product is scheduled for updating. Cost may be prohibitive; not designed to be distributed freely:
Single user license: $595
2-9 organizational license: $575
10-24 organizational license: $500

2) Metamaker
Availability: **Metamaker is no longer being distributed online;** see URL at http://www.umesc.usgs.gov/metamaker/nbiimker.html

Comments: Fully documents all data types; but some elements cumbersome, not user-intuitive, parsers Afussy@. Exports/saves ASCII files in FGDC/NBII standard format; utilizes CNS and MP parsers to generate clearinghouse-ready files. No new versions planned for development by the USGS/Dept. of Interior. (Effective program, but can be tedious to use; cumbersome in editing keyword lists, Aprimitive@ export capabilities - i.e., exports entire keyword list, cannot export keywords by section). Users are advised to upgrade the incorporated CNS and MP parsers to the latest versions (downloadable from the U.S. Geological Survey website at: http://geology.usgs.gov/tools/metadata/)

Metamaker does not put taxonomic information in the NBII standard structure.

3) Metalite 1.7.5
Availability: Free, see URL at http://edcnts11.cr.usgs.gov/metalite/
Comments: Shorter FGDC-compliant metadata system also developed by the USGS; built with minimal FGDC elements. No test version online; download program for review. User-intuitive with a simple interface, with documentation. **Multi-lingual** (English, Spanish, French, Portguese). Utilizes MP to generate clearing-house ready metadata as .TXT, .HTML, and .XML files.

Example of organization-specific tool (built in-house)

4) COMET
Availability: Free, see URL at http://www.chesapeakebay.net/comet/login.cfm

Comments: A condensed, FGDC-compliant online metadata system developed, implemented, and utilized by the Chesapeake Bay Program (incorporates needs of state and Federal

researchers). **Test version** available at this site; possible **model** for successful development and implementation of CORIS Ashort@ metadata form; possibly able to work with Bay Program programmers to revamp this form for coral reefs. **This system is NOT for general use, but serves as an example/model of a working FGDC/NBII compliant metadata tool built by an individual organization to provide researchers with the ability to generate metadata through an online interface.**

5) TKME
Availability: Free, see URL at http://geology.usgs.gov/tools/metadata/tools/doc/tkme.html
Comments: Another FGDC-compliant metadata system also developed by the USGS. No test version online; download program for review. The program is user-intuitive with a simple interface, with documentation.

6) MetaStar from Blue Angel Technologies
Availability: Commercial software, see URL at http://www.blueangeltech.com/

Appendix E. CoRIS Keywords

The CoRIS keywords can be found at http://www.ngdc.noaa.gov/paleo/coris/coris.html. Included are Discovery Keywords, Theme Keywords, and the CoRIS Glossary. Due to the extensive nature of the keywords and thesauri on this website, they are not printed here. It is recommended that the user go to the website and print the appropriate metadata information for their work and include it in this document for easy reference.

APPENDIX F. CoRIS Target Architecture for Twin Search Capability